

CLAIMS

1. Particulate natural magnesium hydroxide having a d_{90} less than or equal to 6.2 μm as measured by CILAS.
- 5 2. Particulate natural magnesium hydroxide according to claim 1, having a d_{90} less than or equal to 6.0 μm as measured by CILAS.
3. Particulate natural magnesium hydroxide according to claim 1, having a d_{90} less
10 than or equal to 5.5 μm as measured by CILAS.
4. Particulate natural magnesium hydroxide according to claim 1, having a d_{90} less than or equal to 5.0 μm as measured by CILAS.
- 15 5. Particulate natural magnesium hydroxide according to claim 1, having a d_{90} less than or equal to 4.5 μm as measured by CILAS.
6. Particulate natural magnesium hydroxide according to claim 1, having a d_{90} less than or equal to 4.0 μm as measured by CILAS.
- 20 7. Particulate natural magnesium hydroxide according to claim 1, having a d_{90} less than or equal to 3.5 μm as measured by CILAS.
8. Particulate natural magnesium hydroxide according to claim 1, having a d_{90} less
25 than or equal to 3.0 μm as measured by CILAS.
9. Particulate natural magnesium hydroxide according to claim 1, having a d_{90} less than or equal to 2.5 μm as measured by CILAS.
- 30 10. Particulate natural magnesium hydroxide according to claim 1, having a d_{90} less than or equal to 2.0 μm as measured by CILAS.
11. Particulate natural magnesium hydroxide according to claim 1, having a d_{90} less than or equal to 1.8 μm as measured by CILAS.

12. Particulate natural magnesium hydroxide according to claim 1, having a d_{90} less than or equal to $1.7\ \mu\text{m}$ as measured by CILAS.
- 5 13. Particulate natural magnesium hydroxide according to any of claims 1 through 12, further having a d_{99} less than or equal to $20\ \mu\text{m}$ as measured by CILAS.
14. Particulate natural magnesium hydroxide according to any of claims 1 through 12, further having a d_{99} less than or equal to $17\ \mu\text{m}$ as measured by CILAS.
- 10 15. Particulate natural magnesium hydroxide according to any of claims 1 through 12, further having a d_{99} less than or equal to $15\ \mu\text{m}$ as measured by CILAS.
16. Particulate natural magnesium hydroxide according to any of claims 1 through 15 12, further having a d_{99} less than or equal to $13\ \mu\text{m}$ as measured by CILAS.
17. Particulate natural magnesium hydroxide according to any of claims 1 through 12, further having a d_{99} less than or equal to $11\ \mu\text{m}$ as measured by CILAS.
- 20 18. Particulate natural magnesium hydroxide according to any of claims 1 through 12, further having a d_{99} less than or equal to $9\ \mu\text{m}$ as measured by CILAS.
19. Particulate natural magnesium hydroxide according to any of claims 1 through 12, further having a d_{99} less than or equal to $7\ \mu\text{m}$ as measured by CILAS.
- 25 20. Particulate natural magnesium hydroxide according to any of claims 5 through 12, further having a d_{99} less than or equal to $5\ \mu\text{m}$ as measured by CILAS.
21. Particulate natural magnesium hydroxide according to claim 1, further having a 30 d_{50} less than or equal to $6.0\ \mu\text{m}$ as measured by CILAS.
22. Particulate natural magnesium hydroxide according to any of claims 1 through 5, further having a d_{50} less than or equal to $4.0\ \mu\text{m}$ as measured by CILAS.

23. Particulate natural magnesium hydroxide according to any of claims 1 through 9, further having a d_{50} less than or equal to $2.0\ \mu\text{m}$ as measured by CILAS.

24. Particulate natural magnesium hydroxide according to any of claims 1 through 10, further having a d_{50} less than or equal to $1.85\ \mu\text{m}$ as measured by CILAS.

25. Particulate natural magnesium hydroxide according to any of claims 1 through 11, further having a d_{50} less than or equal to $1.75\ \mu\text{m}$ as measured by CILAS.

26. Particulate natural magnesium hydroxide according to any of claims 1 through 20, further having a d_{50} less than or equal to $1.5\ \mu\text{m}$ as measured by CILAS.

27. Particulate natural magnesium hydroxide according to any of claims 1 through 20, further having a d_{50} less than or equal to $1.4\ \mu\text{m}$ as measured by CILAS.

28. Particulate natural magnesium hydroxide according to any of claims 1 through 20, further having a d_{50} less than or equal to $1.25\ \mu\text{m}$ as measured by CILAS.

29. Particulate natural magnesium hydroxide according to any of claims 1 through 20, further having a d_{50} less than or equal to $1.0\ \mu\text{m}$ as measured by CILAS.

30. Particulate natural magnesium hydroxide according to any of claims 1 through 20, further having a d_{50} less than or equal to $0.9\ \mu\text{m}$ as measured by CILAS.

31. Particulate natural magnesium hydroxide according to any one of the preceding claims, wherein the particles are surface-treated with one or more surface-treatment agent.

32. Particulate natural magnesium hydroxide according to claim 31, wherein the surface-treatment agent is selected from: saturated or unsaturated fatty acids containing from 8 to 24 carbon atoms, such as, for example, oleic acid, palmitic acid, stearic acid, isostearic acid, ammonium stearate, lauric acid, or metal salts thereof, such as, for example, ammonium stearate, magnesium stearate, magnesium oleate, zinc stearate or zinc oleate; coupling agents, such as, for example, organic silanes or

titanates, such as vinyltriethoxysilane, tri-(2-methoxyethoxy)vinylsilane, vinyltriacetylsilane, aminosilane, tetraisopropyltitanate, tetra-n-butyl-titanate: and any combination thereof.

- 5 33. A process for preparing particulate natural magnesium hydroxide as defined in any one of the preceding claims, wherein brucite is ground in an aqueous suspension in the presence of at least one particulate grinding medium under conditions such that the energy input is in excess of about 20 kWh/tonne.
- 10 34. A process according to claim 33, wherein the at least one particulate grinding medium comprises particles having an average diameter in the range of from 0.1mm to 6.0mm and, more preferably in the range of from 0.2mm to 4.0mm.
- 15 35. A process according to claim 33 or claim 34, wherein the at least one particulate grinding medium is present in an amount of from 40% to 70% by volume of the charge; more preferably in an amount of about 60% by volume of the charge.
- 20 36. Particulate natural magnesium hydroxide as defined in any one of claims 1 to 32, when prepared by a process as defined in any one of claims 33 to 35.
- 25 37. A particulate filler material for use in a polymeric composition, the filler material comprising particulate natural magnesium hydroxide as defined in any one of claims 1 to 32 and 36 and optionally one or more other particulate inorganic material.
- 30 38. A filler material according to claim 37, wherein the said one or more other particulate material is present and is selected from phosphorus-containing compounds, boron-containing compounds, metal salts, metal hydroxides, metal oxides, hydrates thereof, mineral sources of any of the foregoing whether in native or at least partially refined form, organoclays, kaolin clays, other non-kaolin clays, and any combination thereof.
- 35 39. A filler material according to claim 37 or claim 38, wherein the said one or more other particulate material has flame retardant properties and is present with the particulate natural magnesium hydroxide in a flame retardant amount.

40. A filler material for use in a flame retardant polymeric composition, consisting essentially of particulate natural magnesium hydroxide as defined in any one of claims 1 to 32 and 36 and a flame retardant amount of one or more other particulate inorganic material.
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41. A filler material according to any one of claims 37 to 40, wherein the said other particulate inorganic material comprises ATH.
42. A filler material according to any one of claims 37 to 41, wherein the said other
- 10 particulate inorganic material consists essentially of ATH.
43. A filler material according to any one of claims 37 to 42, in the form of a substantially dry powder.
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44. A polymeric composition comprising a polymer and a filler material comprising particulate natural magnesium hydroxide as defined in any one of claims 1 to 32 and 36 and optionally one or more other particulate inorganic material.
45. A polymeric composition according to claim 44, wherein the filler material is as
- 20 claimed in any one of claims 37 to 43.
46. A polymeric composition according to claim 44 or claim 45, wherein the filler material is present in the polymer in an amount of between about 10% and about 90%, by weight of the polymer.
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47. A polymeric composition according to any one of claims 44 to 46, wherein the filler material is present in the polymer in a flame retarding amount.
48. A polymeric composition according to any one of claims 44 to 47, wherein the
- 30 polymer comprises a thermoplastic polymer.
49. A polymeric composition according to any one of claims 44 to 48, wherein the polymer comprises a thermoset polymer.

50. A process for the preparation of a polymeric composition according to any one of claims 44 to 49, which comprises mixing the components of the composition, the polymer component being present for the mixing as liquid or particulate solid, optionally as one or more precursor of the polymer.

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51. A mixture of a particulate filler material as claimed in any one of claims 37 to 43 and a polymer or a precursor thereof in the form of a liquid or particulate solid.

10 52. An article formed from a flame retardant polymer composition as claimed in any one of claims 44 to 49.

53. A sheath, coating or housing for an electrical product, formed from a flame-retardant polymeric composition according to any one of claims 44 to 49.

15 54. An electrical cable comprising a sheath formed from a flame-retardant polymeric composition according to any one of claims 44 to 49.

55. Particulate natural magnesium hydroxide according to any one of claims 1 to 32, having an ISO brightness of at least about 89.

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55. Particulate natural magnesium hydroxide according to any one of claims 1 to 32, having an ISO brightness of at least about 91.

25 56. Particulate natural magnesium hydroxide according to any one of claims 1 to 32, having an ISO brightness of at least about 93.